Cancel substitute page 21.

IN THE CLAIMS:

On page 22, in line 1, cancel "**PATENT CLAIMS**" substitute --**I CLAIM AS MY INVENTION:**-- therefor.

Please cancel claims 1-19 and substitute the following claims 20-38 therefor:

20. A method for determining at least one digital signal value from an electrical signal transmitted via a transmission channel, said electrical signal having signal information and redundancy information for said signal information determined from said signal information, the method comprising the steps of:

optimizing a target function having a model of a transmission channel via which said electrical signal was transmitted;

approximating a dependability degree for forming a digital signal value from said electrical signal based on said optimized target function; and

determining said digital signal value dependent on said dependability degree.

21. The method according to claim 20, wherein said step of determining said digital signal value further comprises determining a number of digital signal values from said electrical signal.

22. The method according to claim 20, whereby said model is a non-linear regression model of said transmission channel.

23. The method according to claim ~~22~~ 20, wherein said target function is formed according to a rule:

$$f = \sum_{i=1}^{k}\left(\beta_i - \frac{4E_b k}{N_0 n} y_i\right)^2 + \sum_{i=k+1}^{n}\left(\ln\left(\frac{1 + \prod\limits_{j \in J_i} \frac{\exp(\beta_j) - 1}{\exp(\beta_j) + 1}}{1 - \prod\limits_{j \in J_i} \frac{\exp(\beta_j) - 1}{\exp(\beta_j) + 1}}\right) - \frac{4E_b k}{N_0 n} y_i\right)^2 .$$

with

$\beta_i = L(U_i|\underline{y}_i)$, and with

$$L(U_i|\underline{y}) = \ln\left(\frac{\sum\limits_{\substack{\underline{v} \in C \\ v_i = +1}} \exp\left(-\frac{(\underline{y} - \underline{v})^T(\underline{y} - \underline{v})}{\frac{N_0 n}{E_b k}}\right)}{\sum\limits_{\substack{\underline{v} \in C \\ v_i = -1}} \exp\left(-\frac{(\underline{y} - \underline{v})^T(\underline{y} - \underline{v})}{\frac{N_0 n}{E_b k}}\right)}\right)$$

, and wherein

- N_0 indicates a single-sided noise power density of said transmission channel,
- n indicates a number of digital signal values contained in said transmission channel,
- E_b denotes an average signal energy for one of k digital signal values,
- k denotes a number of digital signal values contained in said electrical signal,
- $\underline{y}$ denotes a vector from $\mathfrak{R}^n$ that describes said electrical signal,
- C denotes a set of all transmission channel code words,

- $\underline{C}$ denotes an n-dimensional random quantity for describing said digital signal value,
- $\underline{v}$ denotes a vector from C,
- i denotes an index for unambiguous identification of said digital signal value v_i,
- U_i denotes a random variable of said digital signal value v_i,
- $L(U_i|\underline{v})$ denotes said dependability degree,
- J_i denotes a set of digital values of said redundancy information, and
- j denotes a further index.

24. The method according to claim 20, further comprising the step of:

subjecting said target function to a global minimization.

25. The method according to claim 20, wherein said dependability degree comprises an operational sign information and an amount information; and whereby said signal value is determined only dependent on said operational sign information.

26. The method according to claim 20, wherein said electrical signal is a systematic block code.

27. The method according to claim 20, wherein said electrical signal is a radio signal.

28. The method according to claim 20, wherein said electrical signal is a restored signal of archived digital data.

29. An arrangement for determining at least one digital signal value from an electrical signal transmitted via a transmission channel, said electrical signal having signal information and redundancy information for said signal information determined from said signal information, said arrangement comprising:

a computer unit having a processor and a memory including a program comprising the steps of:

optimizing a target function having a model of a transmission channel via which said electrical signal was transmitted;

approximating a dependability degree for forming a digital signal value from said electrical signal based on said optimized target function; and

determining said digital signal value dependent on said dependability degree.

30. The arrangement according to claim 29, further comprising a receiver unit for receiving said electrical signal and for supplying said electrical signal to said computer unit.

31. The arrangement according to claim 30, further comprising a demodulator unit for demodulation of said electrical signal, said demodulator having an input connected to said receiver unit and an output connected to said computer unit.

32. The arrangement according to claim 30, wherein said receiver unit is an antenna.

33. The arrangement according to claim 29, wherein said computer unit is programmed to determine a number of digital signal values from said electrical signal.

34. The arrangement according to claim 29, wherein said model in said computer unit program is a non-linear regression model of said transmission channel.

35. The arrangement according to claim ~~34~~ 29, wherein said target function in said computer unit program operates according to a rule:

$$f = \sum_{i=1}^{k}\left(\beta_i - \frac{4E_b k}{N_0 n} y_i\right)^2 + \sum_{i=k+1}^{n}\left(\ln\left(\frac{1 + \prod\limits_{j\in J_i}\frac{\exp(\beta_j) - 1}{\exp(\beta_j) + 1}}{1 - \prod\limits_{j\in J_i}\frac{\exp(\beta_j) - 1}{\exp(\beta_j) + 1}}\right) - \frac{4E_b k}{N_0 n} y_i\right)^2.$$

with

$\beta_i = L(U_i|\underline{y}_i)$, and with

$$L(U_i|\underline{y}) = \ln\left(\frac{\sum\limits_{\substack{\underline{v}\in C\\ v_i = +1}} \exp\left(-\frac{(\underline{y}-\underline{v})^T(\underline{y}-\underline{v})}{\frac{N_0 n}{E_b k}}\right)}{\sum\limits_{\substack{\underline{v}\in C\\ v_i = -1}} \exp\left(-\frac{(\underline{y}-\underline{v})^T(\underline{y}-\underline{v})}{\frac{N_0 n}{E_b k}}\right)}\right)$$

, and wherein

- N_0 indicates a single-sided noise power density of said transmission channel,
- n indicates a number of digital signal values contained in said transmission channel,
- E_b denotes an average signal energy for one of k digital signal values,
- k denotes a number of digital signal values contained in said electrical signal,

- $\underline{y}$ denotes a vector from $\Re^n$ that describes said electrical signal,
- C denotes a set of all transmission channel code words,
- $\underline{C}$ denotes an n-dimensional random quantity for describing said digital signal value,
- $\underline{v}$ denotes a vector from C,
- i denotes an index for unambiguous identification of said digital signal value v_i,
- U_i denotes a random variable of said digital signal value v_i,
- $L(U_i|\underline{y})$ denotes said dependability degree,
- J_i denotes a set of digital values of said redundancy information, and
- j denotes a further index.

36. The arrangement according to claim 29, wherein said program further comprises the step of:

subjecting said target function to a global minimization.

37. The arrangement according to claim 29, wherein said arrangement is allocated to a radio transmission system.

38. The arrangement according to claim 29, wherein said arrangement is allocated to a system for reconstruction of archived digital data.